



# PLANNING FOR PROFIT

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Ministry of Agriculture,  
Food and Fisheries

## Sea Buckthorn -Southern Interior Spring 2000

This information is a tool to project costs and returns for B.C. farm enterprises and is a general guide to plan individual farm operations.

The sample budget should be used as a guide only and should not be used for business analysis. Each farm should develop their own budget to reflect their production goals, costs and market prices.

Information regarding financial planning and other enterprise budgets may be downloaded from the internet at <http://fbminet.ca/bc> or obtained from your local office of the B.C. Ministry of Agriculture, Food and Fisheries.

### Market Factors

A large number of nutraceuticals and cosmetic products can be made from Sea Buckthorn berries, leaves and bark. The markets for these products are relatively undeveloped in North America although they are strong and diversified in Eastern Europe and China.

The basic processed Sea Buckthorn products are juice, beer, wine, jam, preserves, compote and tea (from the leaves). Essential oil from seed and berry pulp are the most valuable products and have medicinal values. The latest available market prices of Sea Buckthorn oil are \$200 (US)/kg.

Sea Buckthorn fruit juice extraction rate is rated at 65-75% (0.65-0.75 lbs. of juice per 1.0 lb. berries) with an oil extraction rate from juice pulp of up to 18%. The oil extraction rate from oil is rated as up to 15%.

### Risk Factors & Strategies

- Immature market development requires some clarification of market distribution channels for berry processing and products, leaves into the tea markets and oils into the cosmetic markets. Chinese and Russian research provides a substantial body of information to adapt or transfer to B.C. conditions.
- Labour costs are much cheaper in Eastern Europe and Asia. Canadian production will require the development of efficient orchard management and harvesting methods in order to be competitive. The pruning costs are based on a commercial vineyard operation at a similar density with input and modification from commercial growers and B.C. Ministry of Agriculture, Fisheries and Food horticulturalists. Pruning times will vary with cultivar, techniques, density and management.
- Cultivar selection is in the early stages in Canada. Breeding programs for maximum yield, high nutrient and oil content and thornlessness will improve the industry efficiency and decrease production and processing costs.

## Assumptions

The following assumptions were made in calculating the sample budget:

- 1 acre of a ten acre Sea Buckthorn orchard growing in the Southern Interior.
- The operation is well managed.
- Orchard is planted at a density of 1,400 plants/acre using cuttings produced from a Sea Buckthorn nursery at a cost of \$2.20/female cutting and \$3.24/male cutting.
- Orchard is planted in a 6:1 female:male ratio.
- Target Berry Yields of
  - Year 3 = 2,400 lbs./acre (2 lbs./female plant),
  - Year 4 = 6,000 lbs./acre (5 lbs./female),
  - Year 5 = 12,000 lbs./acre (10 lbs./female), Full Production=18,000 lbs/acre (15 lbs/female)
- Target Leaf Yields of
  - Year 4 = 250 lbs.(dry)/acre (0.5 lbs./male and 0.125 lbs./female)
  - Year 5 = 300 lbs./acre (0.6lbs./male and 0.15 lbs./female)
  - Full Production = 500 lbs./acre (1.0 lbs/male and 0.25 lbs./female).
- Machinery Costs (fuel, oil and lube) are for the following operations: Field Preparation (plowing, disking and harrowing) (Year 1) Layout (Year 1), Planting (Year 1), Cultivation (Year 1), Fertilization (Year 1+), Cover Crop Seeding (Year 1), Mowing (Year 1+), Pruning (Year 2+) and Harvesting (Year 2+).
- Labour costs are calculated at \$10.00/hour including UIC, CPP and WCB.
- Layout and planting preparation is estimated to take 20 hours/acre while planting is estimated to take 40 hours/acre.
- The hand weeding cost refers to the area surrounding each Sea Buckthorn plant and thereby reduces weed competition for water and nutrients.
- The pruning cost is assumed at
  - Year 1 = 0.5 min/plant
  - Year 2 = 3.0 min/plant in.
  - Year 3 = 5.0 min/plant in.
  - Year 4 = 6.0 min/plant in.

## Calculation of Projected Net Income

To assess the viability of an enterprise, indirect expenses must be considered. Indirect expenses do not vary with the level of output and are typically associated with inputs used in more than one enterprise.

## Most Likely Income

Less Most Likely Direct Expenses	-
= Contribution Margin	=

Subtract Indirect Expenses	
Overhead	-
Depreciation	-
Interest	-
= Net Income	=

## Labour Requirements

Hours per Acre Sea Buckthorn Orchard  
(10 Acres Total Orchard Size)

Field Preparation	20
Planting	40
Laying Ground Cover	5
Hand Weeding	40
Pruning - Year 1	12
- Year 2	70
- Year 3	117
- Year 4+	140

Total Hours/Acre*	
- Year 1	117
- Year 2	110
- Year 3	325
- Year 4	850
- Year 5	1,321
- Year 6+	1,942

\*Excluding Marketing & Harvesting

Harvest - Fruit	15 lbs/hr
- Leaves (dry)	1.0 lbs/hr
Grade and Sort	300 lbs/hr
(Fruit and Leaves)	

## Buildings and Machinery Replacement Cost

Buildings <sup>1</sup>	\$20,000
Power Machinery <sup>2</sup>	45,000
Field Machinery <sup>3</sup>	19,000
Vehicles	20,000
Other	5,000
Total	\$109,000

- 1 Accomodates equipment and supply storage, and workshop
- 2 New 70 Hp tractor
- 3 Plow, disk, harrows, fertilizer spreader, wagons

## Sample Enterprise Budget and Worksheet Sea Buckthorn 1 Acre - Southern Interior

The sample enterprise budget provided should be viewed as a first approximation only. Use the column "Your Estimate" to add, delete and adjust items to reflect your specific production situation.

The sample budget is based on interviews with producers and BCMAF commodity specialists. Cost estimates are based on standard practices in the area and do not represent any particular farm.

	<b>Year 1</b>	<b>Your Estimate</b>	<b>Year 2</b>	<b>Your Estimate</b>	<b>Year 3</b>	<b>Your Estimate</b>	<b>Year 4</b>	<b>Your Estimate</b>	<b>Year 5</b>	<b>Your Estimate</b>	<b>Year 6</b>	<b>Your Estimate</b>
<b>Projected Yields (lbs/acre)</b>												
Berries (lbs)	0		0		2,400		6,000		12,000		18,000	
Leaves (dry lbs.)	0		0		0		250		300		500	
<b>Projected Direct Expenses</b>												
Plants	\$3,288		\$0		\$0		\$0		\$0		\$0	
Irrigation System	1,500											
Fertilizer (14-16-10)	69		69				38					
Fertilizer (19-18-19)											41	
Ground Cover	2,784											
Pest Control	30		30		30		30		30		30	
<b>Machinery Operation</b>												
Fuel, Oil, Lubrication	148		21		66		179		288		428	
Repairs & Maintenance	0		300		300		300		300		300	
<b>Labour</b>												
Layout & Planting Prep	200											
Planting	400											
Laying Ground Cover	50											
Hand Weeding	400		400		400		400		400		400	
Pruning	120		700		1,170		1,400		1,400		1,400	
Harvesting - Berries					1,600		4,000		8,000		12,000	
Harvesting - Leaves							2,500		3,000		5,000	
Grading and Sorting					80		207		410		620	
Marketing					200		400		800		1,000	
<b>Total Direct Expenses</b>	<b>\$8,989</b>		<b>\$1,520</b>		<b>\$3,846</b>		<b>\$9,454</b>		<b>\$14,628</b>		<b>\$21,218</b>	

## Key Success Factors

- Processed product market development
- Mechanical harvesting
- Cultivar selection

## Production Targets

- Full Production Berry Yields: 18,000 lbs.
- Full Production Leaf Yields: 500 lbs.

The above indicators are provided for comparison purposes and are set out as potential production targets.

## Sensitivity Analysis—Projected Income

The profitability of a Sea Buckthorn operation will depend strongly on successful marketing.

The table below illustrates the changes to

- income as berry yield varies.
- income as labour costs vary.
- income as nursery stock costs vary.

	Berry Yield lbs/Acre			
Production	80%	<b>100%</b>	120%	140%
Cost				
Year 1	8,989	<b>8,989</b>	8,989	8,989
Year 2	1,520	<b>1,520</b>	1,520	1,520
Year 3	3,510	<b>3,846</b>	4,182	4,518
Year 4	8,613	<b>9,454</b>	10,296	11,137
Year 5	12,946	<b>14,628</b>	16,310	17,992
Year 6	18,694	<b>21,218</b>	23,742	26,266

  

	Labour Cost \$/hr			
Production	8.00	<b>10.00</b>	12.00	14.00
Cost				
Year 1	8,755	<b>8,989</b>	9,223	9,457
Year 2	1,300	<b>1,520</b>	1,740	1,960
Year 3	3,196	<b>3,846</b>	4,496	5,146
Year 4	7,753	<b>9,454</b>	11,156	12,858
Year 5	11,986	<b>14,628</b>	17,270	19,912
Year 6	17,334	<b>21,218</b>	25,102	28,986

  

	Nursery Stock Cost \$/cutting			
Production	2.00	<b>2.35</b>	4.00	6.00
Cost				
Year 1	8,501	<b>8,989</b>	11,301	14,101

## For More Information

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